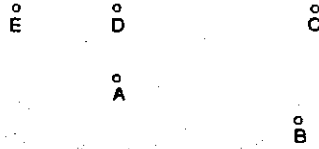


GEOMETRY TEAM TEST

QUESTION 1

FEBRUARY 1997

1. Consider points A, B, C, D, and E as shown



Let a = If two points are selected at random, what is the probability that they are collinear?

Let b = If three of these points are selected at random, what is the probability that they are collinear?

Let c = If four of these points are selected at random, what is the probability that they are collinear?

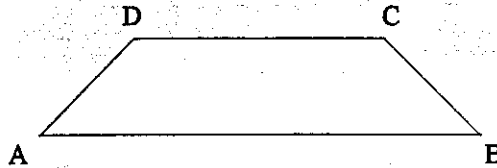
Find $a + b + c$

GEOMETRY TEAM TEST

QUESTION 2

FEBRUARY 1997

2. Find the perimeter of trapezoid ABCD if $m\angle D = 150^\circ$, $m\angle C = 135^\circ$, $AD = 10$ and $DC = 12$.



GEOMETRY TEAM TEST

QUESTION 3

FEBRUARY 1997

3. The degree measures of the interior angles of an octagon are in the ratio of 7:9:11:17:21:10:19:14. Find the positive difference between the smallest and the largest angles.

GEOMETRY TEAM TEST

QUESTION 4

FEBRUARY 1997

4. A girl wishes to cut the largest possible square out of a piece of cardboard in the shape of a right triangle, with legs of 8 inches and 12 inches. Find a side of the square, in inches.

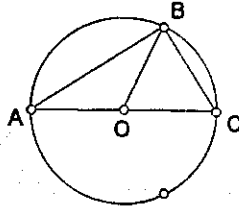
GEOMETRY TEAM TEST

QUESTION 5

FEBRUARY 1997

5. Keith is going to build a pen for his dog Tater. One side of the rectangular pen will be provided by an existing fence. He wants Tater to have the most space possible, but he only has 60 feet of fence to use for the remaining three sides. What is the largest area for Tater's new dog pen?

6. In circle O, $m\angle ABO = 2x + y$, $m\angle OBC = 6x + 8$, $m\angle AOB = 23y + 90$, and $m\angle BOC = 4x + 4$. Find $m\angle ABO$.



7. If 6 points are represented on a sheet of paper in such a way that any four of them are noncollinear. What is the maximum and minimum number of lines determined?

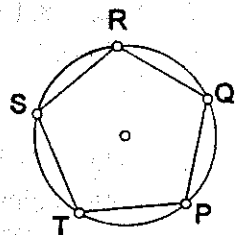
Let a represent the maximum number of lines determined.

Let b represent the minimum number of lines determined.

Find $a + b$

8. If the perimeter of a square circumscribed about a circle is 32, find the perimeter of a square inscribed in the circle.

9. PQRST is an inscribed pentagon and the measure of arc RQ is 80° . Find $m\angle S + m\angle P$.



GEOMETRY TEAM TEST

QUESTION 10

FEBRUARY 1997

10. The centers of two circles of radii of lengths 3 and 8 are 13 units apart. Find the common external tangent segment.

GEOMETRY TEAM TEST

QUESTION 11

FEBRUARY 1997

11. The length of each side of a square is 8. The four corners are cut off to form a regular octagon. Find its perimeter.

GEOMETRY TEAM TEST

QUESTION 12

FEBRUARY 1997

12. A right cylinder is inscribed in a right square prism of the same height. A radius and an altitude of the cylinder are each 10cm long. What is the ratio of their total areas?

GEOMETRY TEAM TEST

QUESTION 13

FEBRUARY 1997

13. Find the area of a parallelogram with vertices $(-1, 2)$, $(1, 2)$, $(2, -4)$, and $(4, -4)$.

GEOMETRY TEAM TEST

QUESTION 14

FEBRUARY 1997

14. A side of an equilateral triangle is 1 cm long. What is the length of the side of an equilateral triangle with twice the area?

GEOMETRY TEAM TEST

QUESTION 15

FEBRUARY 1997

15. The ratio of the complements of two angles is 3:2, and the ratio of their supplements is 9:8. Find the sum of the original angles.